

Serial No. 10/044,279

Docket No.: 55476US005

Remarks

Applicant has amended the title substantially as recommended by the Examiner, editorially amended patent application citations in paragraphs 0001, 0005, 0006, 0030, 0043 and 0047 and editorially amended paragraph 0060.

Claim 1 has been amended to recite two coating/uniformity improvement modes, namely, a first mode in steps A1 through A3 involving application of a coating and contacting the applied coating with at least two wire-wound pick-and-place coating rods whose contact periods differ and are not periodically related, and a second mode in steps B1 and B2 involving application of a coating whose caliper varies in the web direction and contacting the applied coating with at least two wire-wound pick-and-place coating rods. Claims 2 – 15, 18 – 20 and 23 have been editorially amended. Claim 17 has been amended to recite changing the period of rotation during operation. Claim 19 has been amended to place it in independent form as recommended by the Examiner, but with recitation of a surface speed differential “relative to the substrate” rather than “relative to the surface speed of the support”. Claim 21 has been amended to recite applying a pattern of cross web stripes. Support for these claim amendments may be found in, e.g., paragraphs 0005, 0022, 0029, 0021, 0037, 0043, 0045 and 0060.

Following entry of this amendment, claims 1 – 28 will be pending in this application with claims 29 – 58 having been withdrawn.

On February 20, 2004 restriction was telephonically requested from among the following Groups of claims:

- I. Claims 1 – 28, drawn to a method for improving the uniformity of a wet coating on a substrate, classified in class 427, subclass 359; and
- II. Claims 29 – 58, drawn to a device, classified in class 118, subclass 110.

Applicant hereby confirms his election of Group I, viz. claims 1 – 28, without traverse.

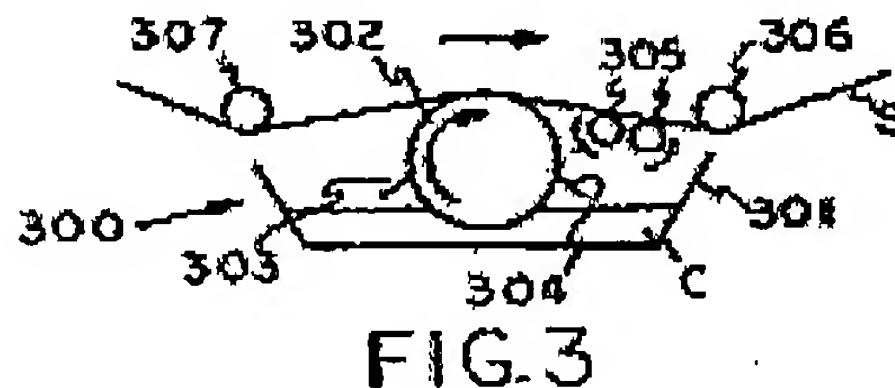
Rejection of Claims 1, 4, 7, 8 and 16 under 35 USC §102(b)

Claims 1, 4, 7, 8 and 16 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 3,844,813 A (Leonard et al.) on grounds that Leonard et al. “teaches a process in which a wet coating on a substrate is contacted with at least two, rotating wire-wound (Mayer) rods, thereby evening the composition across the surface of the substrate”. Applicant requests reconsideration. Leonard et al. describes a textile coating apparatus

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which in one embodiment may employ counter-rotating Mayer rods 305 that “are used to even the composition across the surface of Substrate S instead of a blade” (see e.g., col. 7, line 66 through col. 8, line 2 and Fig. 3):



Leonard et al. seek improved cross web uniformity, not improved coating caliper uniformity in the direction of substrate motion as recited in claim 1.

Leonard et al. say that “The degree of movement or replacement of composition can be varied by the different sizes of Mayer rod and also by the rotational speed of the Mayer rods” (see e.g., col. 8, lines 5 – 8) and that “any desired number of Mayer rods may be used” (see e.g., col. 8, lines 10 – 11) but only show only two Mayer rods that appear to have the same diameter and only show operation of both Mayer rods at identical rotational speeds (see e.g., Examples 2 and 3). Leonard et al. do not disclose claim 1’s steps A1 through A3 or steps B1 and B2.

With respect to claim 16, Leonard et al. do not show a “sheet” (see e.g., page 12, lines 15 – 16 and Fig. 8), and do not show a sheet “mounted” on a rotating support.

Applicant accordingly requests withdrawal of the rejection of claims 1, 4, 7, 8 and 16 as being anticipated by Leonard et al.

Rejection of Claims 2 – 6, 9 – 11, 17 and 18 under 35 USC §103(a)

Claims 2 – 6, 9 – 11, 17 and 18 were rejected under 35 USC §103(a) as being unpatentable over Leonard et al. As noted in the Office Action, Leonard et al. states that “The Mayer rods 305 are controllable as to size and speed to even the coating and, if necessary, to accurately meter off any excess” (col. 12, lines 20 – 23). Leonard et al. does not disclose pick-and-place devices or their use to improve downweb coating uniformity. Leonard et al. place Mayer rods 305 on the underside of substrate S above a drip pan 301,

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and rotate the rods at high speed against the direction of substrate motion. In Leonard et al.'s words, the Mayer rods will "meter off" excess coating material C from substrate S. Leonard et al. do not disclose use of a Mayer rod to pick off excess coating from high spots and place it onto low spots as described by applicant (see e.g., paragraph 0033).

The Office Action asserts that "it is well-known that the both the speed and size of a roller or rotating rod determine the period of contact thereof". In accordance with MPEP §2144.03 (C), applicant requests supporting evidence for this assertion insofar as it relates to contact periods of pick-and-place devices and coating uniformity improvement. Leonard et al. mention roll speed and roll diameter changes in a high speed counter-rotating cross web smoothing device. Leonard et al. do not say anything regarding contact periods or pick-and-place devices, and no other reference or evidence has been provided to show that those skilled in the art would have any reason to employ pick-and-place devices, examine their contact periods or modify those contact periods.

The Office Action also asserts an absence of "evidence of unexpected results demonstrating the criticality of the claimed size, speed and period". Applicant respectfully disagrees. Applicant's Example demonstrates conversion of a discontinuous coating made from cross web stripes into a continuous, void-free coating (see e.g., paragraphs 0057 through 0060). Starting with a discontinuous coating is itself counterintuitive, and has not been shown to have been recommended by those skilled in the art. Applicant's parent U.S. Patent No. 6,737,113 B1 (which was incorporated by reference in paragraph 0001) contains additional evidence of unexpected results obtained using smooth rollers rather than wire-wound rods, and paragraph 0030 notes that "Further details regarding the basic principles of operation of the devices of the invention are shown in detail" in that patent.

As noted in MPEP §2143.03, "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art". Leonard et al. do not teach or suggest contacting a substrate with wire-wound rods that "do not have the same period of contact with the substrate" as recited in claim 2; or that have rotational periods that "are not periodically related" as recited in claim 3; or that "all have different periods of rotation" as recited in claim 5. Leonard et al.'s working examples employ two wire-wound rods having a progression of larger wire diameters (*viz.*, a number 25 wire followed by a number 20 wire, see e.g., col. 13, lines 63 – 64), not a progression

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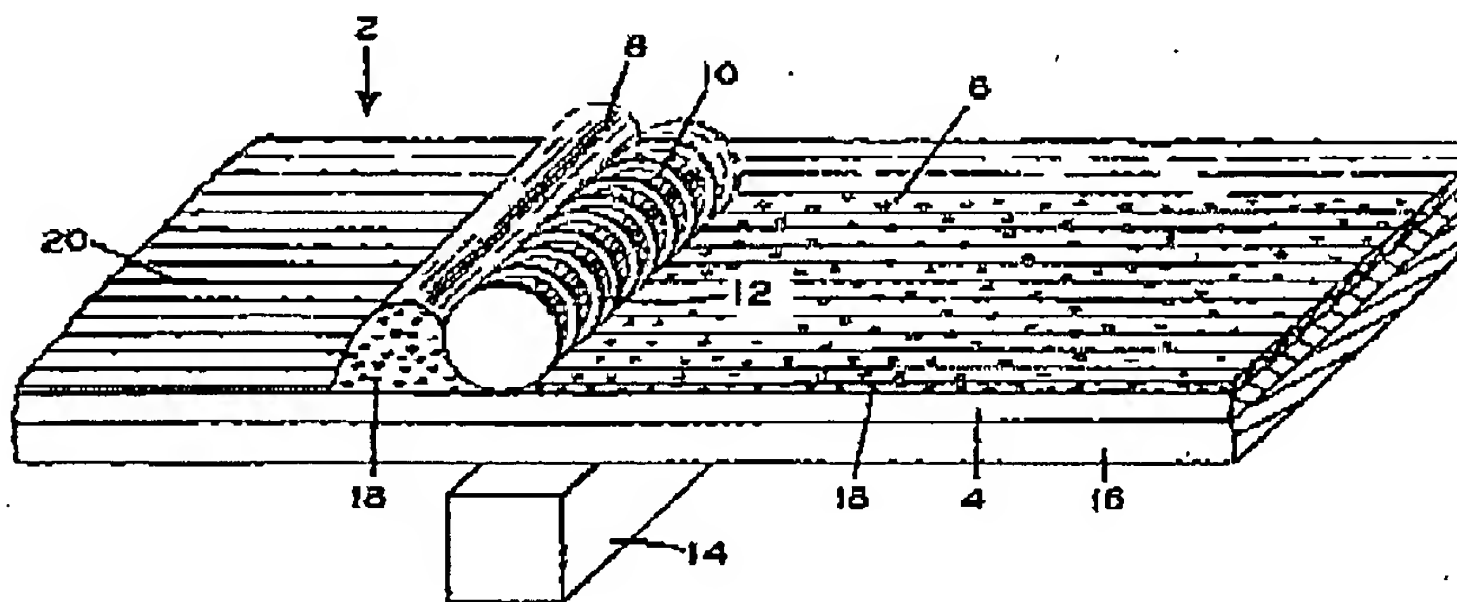
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of smaller and smaller wire diameters as recited in claim 6. Leonard et al. do not teach or suggest applying a discontinuous coating whose caliper spatially varies in the direction of motion as recited in claims 9 – 11 and do not teach or suggest changing the period of rotation of a wire-wound rod during operation as recited in claim 17.

Applicant accordingly requests withdrawal of the rejection of claims 2 – 6, 9 – 11, 17 and 18 as being unpatentable over Leonard et al.

Rejection of Claims 12 – 15 under 35 USC §103(a)

Claims 12 – 15 were rejected under 35 USC §103(a) as being unpatentable over Leonard et al. as applied to claim 1 above, and further in view of U.S. Patent Nos. 3,718,117 A (Lewicki, Jr.) and 2,066,780 A (Holt). Leonard's Fig. 3 embodiment applies a coating using kiss coater roll 302 and then smoothes the applied coating in the cross web direction using Mayer rods 305. Lewicki, Jr. applies a coating 6 using a single grooved rod 10:



Holt applies paint 29 using a primary doctor 19 in the form of a grooved or wire-wound rod and then smoothes the applied coating in the cross web direction using a secondary doctor 32 in the form of a smoothing blade:

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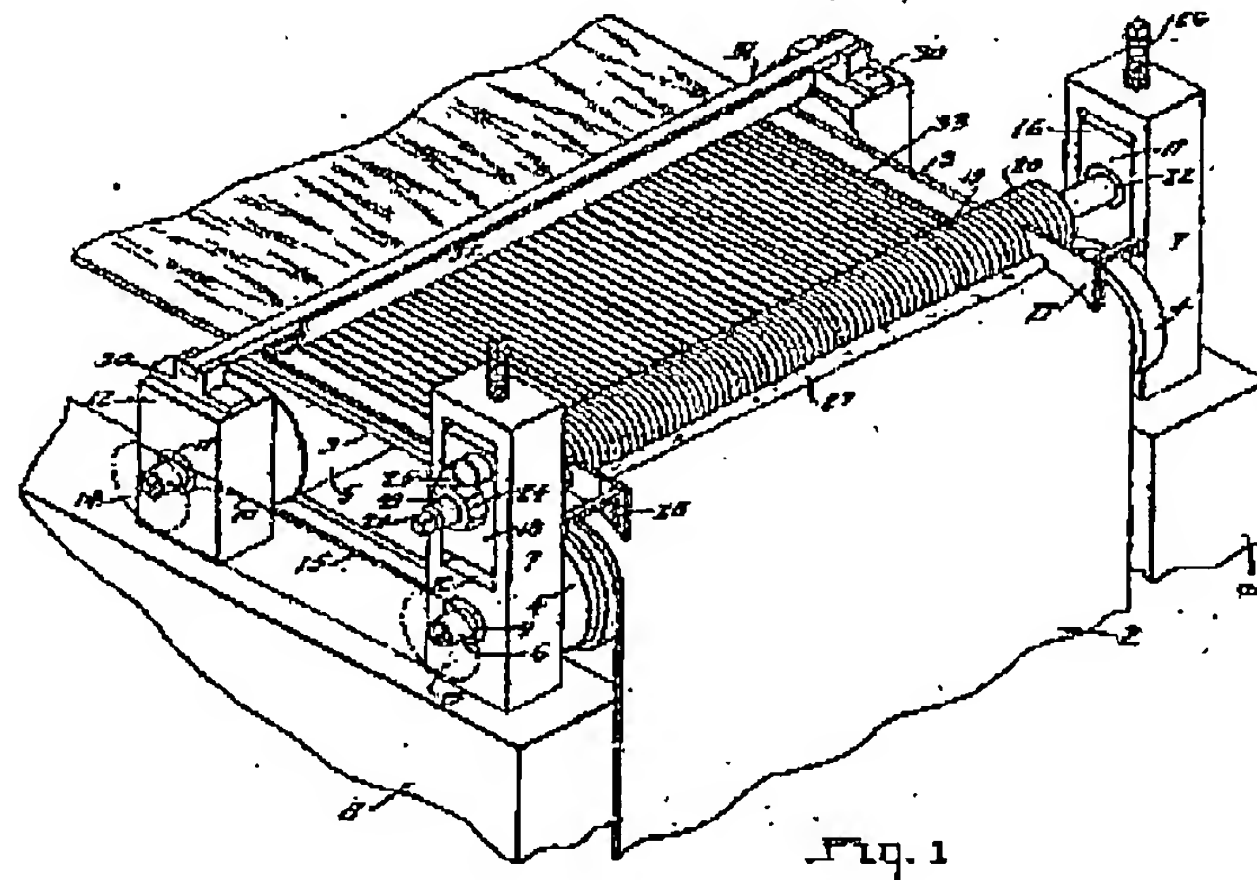


Fig. 1

Neither Lewicki, Jr. nor Holt contacts and re-contacts an applied coating using a wire-wound pick-and-place rod, and neither discloses using two or more such rods to improve caliper uniformity in the direction of substrate motion. As noted in MPEP §2141, “references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination”. The wire-wound or grooved rods in Lewicki, Jr. and Holt involve coating application devices (in the words of the Office Action, “to provide” or “in providing” a uniform liquid coating), not pick-and-place devices that act upon an applied coating. Lewicki, Jr. and Holt would not be used by a person having ordinary skill in the art to modify Leonard et al. as asserted in the Office Action. Applicant accordingly requests withdrawal of the rejection of claims 12 – 15 under 35 USC §103(a) as being unpatentable over Leonard et al. in view of Lewicki, Jr. and Holt.

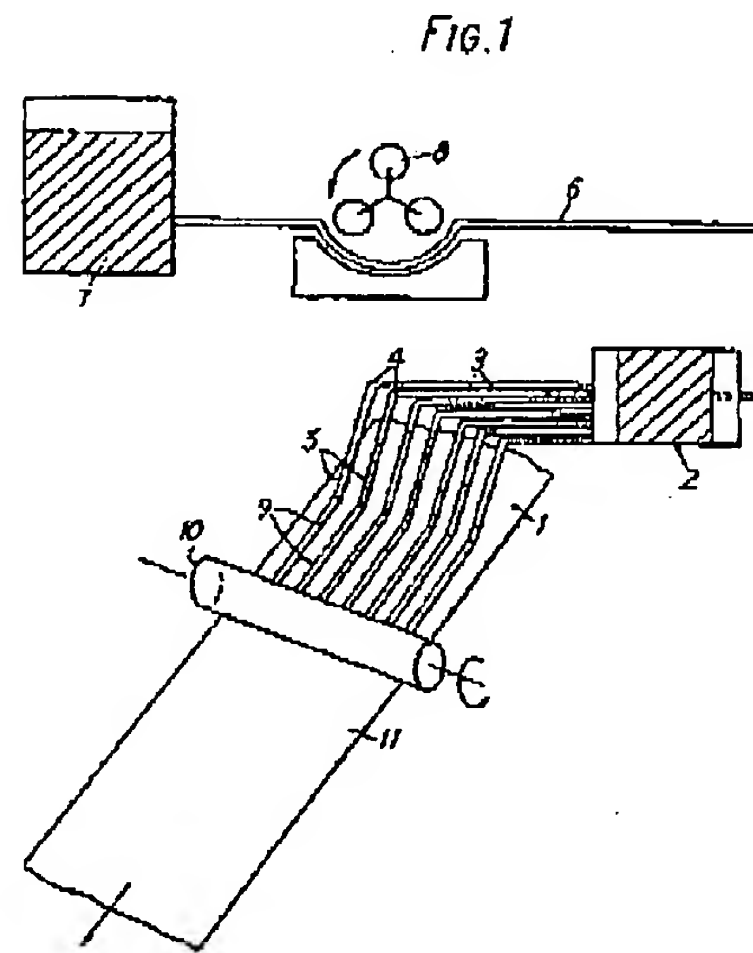
Rejection of Claims 20 – 24, 26 and 27 under 35 USC §103(a)

Claims 20 – 24, 26 and 27 were rejected under 35 USC §103(a) as being unpatentable over Leonard et al. as applied to claim 1 above, and further in view of U.S. Patent No. 4,102,301 A (Reade et al.). The Office Action asserts that Reade et al. “teaches a process in which a moving substrate is coated with a liquid coating material in the form of stripes, with the coating later treated to improve the uniformity thereof”. Applicant requests reconsideration. Reade et al.’s device is shown, for example, in Reade et al.’s

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Fig. 1, and in one embodiment is used to apply a set of longitudinal stripes 5 to lay-flat tubular web 1:



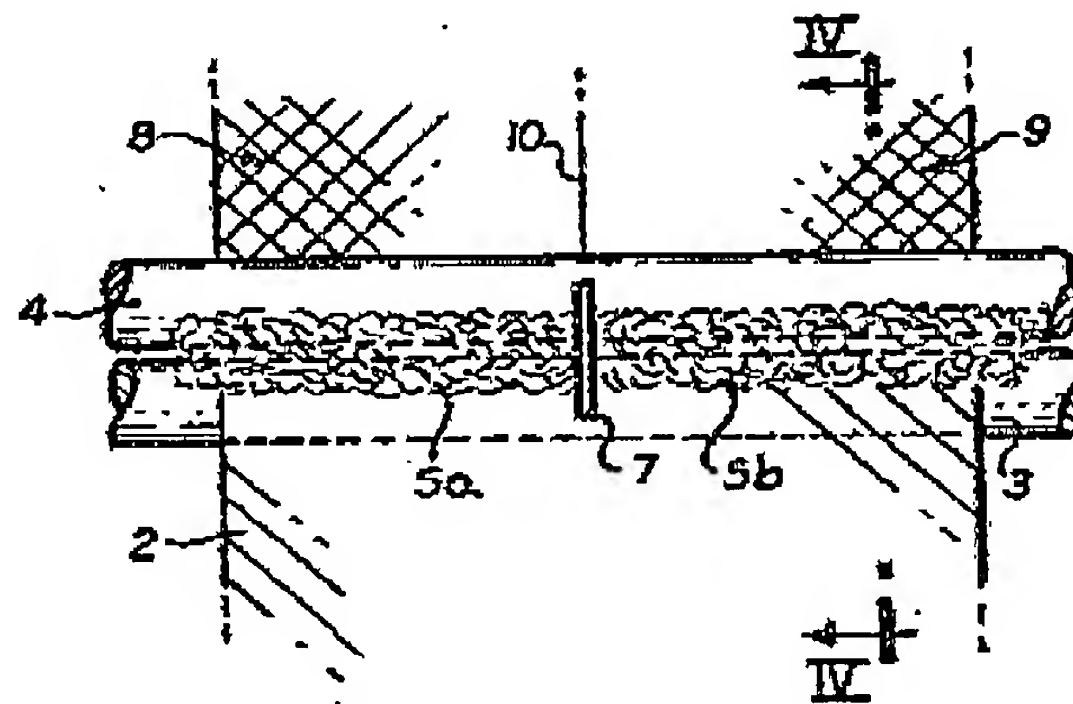
Reade et al. do not disclose or suggest application of a discontinuous coating "whose caliper spatially varies in the direction of motion" as recited in claims 20 – 23 or a "discontinuous or deliberately uneven" wet coating whose caliper spatially varies in the direction of motion as recited in claims 24, 26 and 27. No proper combination of Leonard et al. and Reade et al. would lead a person having ordinary skill in the art to apply such coatings. Applicant accordingly requests withdrawal of the rejection of claims 20 – 24, 26 and 27 under 35 USC §103(a) as being unpatentable over Leonard et al. in view of Reade et al.

Rejection of Claim 28 under 35 USC §103(a)

Claim 28 was were rejected under 35 USC §103(a) as being unpatentable over Leonard et al. in view of Reade et al. as applied to claim 26 above, and further in view of U.S. Patent Nos. 4,344,989 A (Thornton et al.) Thornton et al. apply binders to zones on a non-woven web using a dividing baffle and preferably using a viscous or foamed adhesive to limit intermixing (see e.g., col. 4, line 50 through col. 5, line 8 and Fig. 3):

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**FIG. 3.**

Thornton et al. explicitly state however that intermixing occurs and that their process provides a coated non-woven web having an intermediate zone:

“wherein the binder of the first zone and the binder of the second zone merge so that the entire fabric has a gradual change in binding characteristics from the first zone to the second zone via the intermediate zone. In all instances, the binder content is uniformly distributed in the zones such that there is no sudden change in properties.” (see col. 2, lines 58 – 64).

The process of applicant's Claim 28 facilitates formation of coatings having distinct neighboring lanes containing two or more differing formulations. As explained by applicant at paragraph 0054:

“Because the amount of applied coating liquid can be premetered to prevent or discourage the formation of rolling banks of liquid behind the coating rods, cross web mixing and lane edge deterioration are prevented or discouraged. In contrast, in conventional Mayer rod coating an excess of coating liquid typically is applied, and it is difficult to form distinct lanes of coating. Instead, lane edge deterioration or cross web mixing occurs in the rolling bank or banks of liquid behind the coating rod.”

This is in fact what apparently happens in Thornton et al. The proposed combination of Leonard et al., Reade et al. and Thornton et al. would not provide a method for improving the uniformity of a coating comprising two or more adjacent lanes containing two or more differing formulations as recited in claim 28. Applicant accordingly requests withdrawal

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of the rejection of claim 28 under 35 USC §103(a) as being unpatentable over Leonard et al. in view of Reade et al and further in view of Thornton et al.

Conclusion

Applicant has made an earnest effort to overcome all rejections asserted in the Office Action. Claim 19 has been amended and rewritten in independent form as recommended and should be allowable. The remaining claims should be allowable as well.

Leonard et al. seek improved cross web uniformity, not improved coating caliper uniformity in the direction of substrate motion as recited in claim 1; do not disclose claim 1's steps A1 through A3 or steps B1 and B2; do not anticipate claims 1, 4, 7, 8 or 16; and do not make obvious claims 2 – 6, 9 – 11, 17 or 18.

Lewicki, Jr. and Holt involve coating application devices, not pick-and-place devices that act upon an applied coating; do not contact and re-contact an applied coating using a wire-wound pick-and-place rod; do not disclose using two or more such rods to improve caliper uniformity in the direction of substrate motion; would not be used by a person having ordinary skill in the art to modify Leonard et al. as asserted in the Office Action; and would not make obvious claims 12 – 15.

Reade et al. apply longitudinal stripes to a lay-flat tubular web but do not disclose or suggest application of a discontinuous coating "whose caliper spatially varies in the direction of motion" as recited in claims 20 – 23 or a "discontinuous or deliberately uneven" wet coating whose caliper spatially varies in the direction of motion as recited in claims 24, 26 and 27. No proper combination of Leonard et al. and Reade et al. would lead a person having ordinary skill in the art to apply such coatings or carry out the method of claims 20 – 24, 26 or 27.

Thornton et al. apply binders to zones on a non-woven web using a dividing baffle; state that intermixing occurs; and would not provide a basis for modifying Leonard et al. or Reade et al to provide a method for improving the uniformity of a coating comprising two or more adjacent lanes containing two or more differing formulations as recited in claim 28.

Applicant accordingly requests reconsideration and withdrawal of the rejections, and passage of the application to the issue branch.

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